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[54] **NEURAL NETWORK BASED CHARACTER POSITION DETECTOR FOR USE IN OPTICAL CHARACTER RECOGNITION**

[75] Inventors: **Alexander Shustorovich; Christopher W. Thrasher**, both of Rochester, N.Y.

[73] Assignee: **Eastman Kodak Company**, Rochester, N.Y.

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(List continued on next page.)

Primary Examiner—Joseph Mancuso

Attorney, Agent, or Firm—Dennis R. Arndt

[57] **ABSTRACT**

Apparatus, and an accompanying method, for use in an optical character recognition (OCR) system (5) for locating, e.g., center positions ("hearts") of all desired characters within a field (310; 510) of characters such that the desired characters can be subsequently recognized using an appropriate classification process. Specifically, a window (520) is slid in a step-wise convolutional-like fashion (520₁, 520₂, 520₃) across a field of preprocessed, specifically uniformly scaled, characters. Each pixel in the window is applied as an input to a positioning neural network (152) that has been trained to produce an output activation whenever a character "heart" is spatially coincident with a pixel position within an array (430) centrally located within the window. As the window is successively moved across the field, in a stepped fashion, the activation outputs of the neural network are averaged, on a weighted basis, for each different window position and separately for each horizontal pixel position in the field. The resulting averaged activation output values, typically in the form of a Gaussian distribution for each character, are then filtered, thresholded and then used, via a weighted average calculation with horizontal pixel positions being used as the weights, to determine the character "heart" position as being the center pixel position in the distribution.

23 Claims, 16 Drawing Sheets

